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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,673	08/13/2008	Moshe Shoham	20763/0205292-US0	4768

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EXAMINER

AMIN, BHAVESH V

ART UNIT	PAPER NUMBER
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3664

NOTIFICATION DATE	DELIVERY MODE
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11/04/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/597,673	SHOHAM, MOSHE	
	Examiner	Art Unit	
	BHAVESH V. AMIN	3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1,2,4,6,8,9,12,13,15,17-19,21,23,25,28,29,31,33 and 34 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1,2,4,6,8,9,12,13,15,17-19,21,23,25,28,29,31,33 and 34 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed subject matter of **claims 33 & 34** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Specifically applicant needs to include how the verification process actually determines that the verification has a statistically insignificant probability of falsehood. Applicant can either show a flow diagram or give a formulae and its use in the specification but no new matter should be added.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 33 & 34** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for disclosing statistical processes, does not reasonably provide enablement for the “sensors having a reliability such that the likelihood that two sensors or more fail simultaneously in a mode that makes said failures undetectable is statistically insignificant in relation to the safety requirement.” The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. Applicant’s specification in paragraphs 44 – 49 describes how the system uses statistical methods to determine if two sensors would fail at the same time. They do not describe what applicant claims in claims 33 & 34 and hence one would not be able to figure out how to calculate or use, “failures undetectable is statistically insignificant.” More specifically what value would this be i.e., zero percent, 1 percent 5 percent or 10 percent? How is this value determined, and what factors are used to determine this value and what process is used to determine what is statistically insignificant.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 33 & 34** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Where applicant claims “sensors having reliability such that the likelihood that two sensors or more fail simultaneously in a mode that makes said failures undetectable is statistically insignificant in relation to the safety requirement.” It is not clear as to what the meets and bounds of the claims are as one would not be able to ascertain what is meant by “failures undetectable is statistically insignificant.” Thus **claims 33 & 34** will not be examined on the merits as what is being claim is unclear and can not be ascertained from the specification either.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1, 15, 17 & 31** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shoham US PG Pub 20020038118 A1.

Regarding claims 1 & 17 where it is disclosed by Shoham to have both the apparatus and method of control a hybrid-parallel robot using position sensors. This is read upon by applicant's claim as indicated below:

“A robot comprising: a base member; a moving platform operative as the end effector of the robot [figure 2]; a plurality of adjustable links connecting said base member to said moving platform [figure 2], the status of each of said plurality of adjustable links being known by means of a sensor associated with each of said plurality of links [paragraph 24], the combined outputs of said plurality of sensors indicating the pose of said platform [paragraphs 24-28]; and a single additional sensor connected between said base member and said moving platform [paragraph 24], wherein said single additional sensor provides an indication of an erroneous output in the reading of any one of said plurality of sensors [paragraph 24].” However if applicant finds that it is not inherently disclosed by Shoham to have an additional sensor, then the mere duplication of part by one of ordinary skill in the art is considered to be capable by one of ordinary skill in the art and hence it would have been obvious to have an additional sensor for redundancy purposes and also to increase accuracy of the device.

Regarding claims 15 & 31 where it is disclosed by Shoham to have a, “robot [which] is either of a parallel robot and a hybrid series-parallel robot.” This is shown in figure 2.

Regarding claim 17 where it is disclosed by Shoham to have, “A method of using a robot, comprising the steps of: providing a robot comprising a base member [fig 2], a moving platform operative as the end effector of the robot [fig 2], and a plurality of adjustable links connecting said base member to said moving platform [fig 2], the status of each of said adjustable links being known by means of a sensor associated with each of said links [fig 2 & paragraph 24 - 28], and the combined outputs of said plurality of

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sensors indicating the pose of said platform; connecting a single additional sensor between said base member and said moving platform between known points thereon [fig 2 & paragraph 24-28]; and using information from said single additional sensor to provide an indication of an erroneous output in the reading of any one of said plurality of sensors [Fig 2 and paragraph 24-28].”

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1 & 17** are rejected under 35 U.S.C. 102(e) as being anticipated by Zhu et al., US Patent 7040033 B2 (hereafter referenced as Zhu).

Regarding claims 1 & 17 where it is disclosed by Zhu to have, “A robot comprising: a base member [figs 2-4]; a moving platform operative as the end effector of the robot [figs 2-4]; a plurality of adjustable links connecting said base member to said moving platform [figs 2-4], the status of each of said plurality of adjustable links being known by means of a sensor associated with each of said plurality of links [figs 2-4], the combined outputs of said plurality of sensors indicating the pose of said platform [figs 2-4]; and a single additional sensor connected between said base member and said moving platform [figs 2-4], wherein said single additional sensor provides an indication of an erroneous output in the reading of any one of said plurality of sensors [figures 2-4].”

Zhu also discloses, “A method of using a robot, comprising the steps of: providing a robot comprising a base member [figs 2-4], a moving platform operative as the end effector of the robot [figs 2-4], and a plurality of adjustable links connecting said base member to said moving platform [figs 2-4], the status of each of said adjustable links being known by means of a sensor associated with each of said links [figs 2-4 & columns 3 & 4 lines 19 – 67 & 1 – 67 respectively], and the combined outputs of said plurality of sensors indicating the pose of said platform [figs 2-4 & columns 3 & 4 lines 19 – 67 & 1 – 67 respectively]; connecting a single additional sensor between said base member and said moving platform between known points thereon [figs 2-4 & columns 3 & 4 lines 19 – 67 & 1 – 67 respectively]; and using information from said single additional sensor to provide an indication of an erroneous output in the reading of any one of said plurality of sensors [figs 2-4 & columns 3 & 4 lines 19 – 67 & 1 – 67 respectively].”

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. **Claims 2, 4, 6, 15, 19, 21 & 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoham in further view of Sheldon US Patent 5870834.

Regarding claims 2 & 19 where all the limitations of claim 1 & 17 respectively, are disclosed by Shoham who does not specifically disclose the limitation of, “at least

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one of said adjustable links is a linear extensible link and said sensor associated with said linear extensible link is a length sensor.” This is disclosed by Sheldon in column 4 lines 1 – 40, thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify Shoham by Sheldon to determine the accurate position of the robot and reduce errors from the position sensors.

Regarding claims 4 & 21 where all the limitations of claim 1 & 17 respectively, are disclosed by Shoham who does not specifically disclose the limitation of, “at least one of said adjustable links is an angular rotational hinge, and said sensor associated with said angular rotational hinge is an angular sensor.” This is disclosed by Sheldon in column 4 lines 20 – 30.

Regarding claims 6 & 23, all the limitations of claims 1 & 17 respectively, are disclosed by Shoham who does not specifically disclose the further limitation of, “single additional sensor is any one of a length sensor and an angular sensor.” This is disclosed by Sheldon in column 4 lines 20 – 30.

11. **Claims 8, 9, 12-13, 18, 25 & 28-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoham and further in view of Zhu et al., US Patent 7040033 B2 (hereafter referenced as Zhu).

Regarding claims 8 & 18 where all the limitations of claims 1 & 17, respectively, are disclosed by Shoham who does not specifically disclose the further limitation of, “a controller which verifies at least one of the position and orientation of said moving platform as determined by the sensors associated with each of said plurality of links, by means of the output of said single additional sensor [columns 3 & 4 lines 19-67 & 1-40,

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respectively].” This is disclosed by Zhu as indicated in the above citation. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify Shoham by Zhu to allow for precision measurements and accuracy need for robot movement between tool and the work piece.

Regarding claims 9 & 25 where all the limitations of claims 8 & 18 respectively, are disclosed by Shoham and Zhu and it is further disclosed by Zhu in columns 3 & 4 lines 19-67 & 1-40, respectively, to have, “said controller provides an absolute verification of at least one of the position and orientation of said moving platform in the event that any one sensor is providing an erroneous output.” Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify Shoham by Zhu to allow for precision measurements and accuracy need for robot movement between tool and the work piece.

Regarding claims 12 -13 & 28-29 where all the limitations of claims 1 & 17 respectively, are disclosed by Shoham who does not specifically disclose having a 5th or 7th sensor and thus this is shown by Zhu where they have multiple sensor to compare with each other to determine the position of the robot. Thus Zhu discloses the invention except having an extra 7th sensor. It would have been obvious to one having ordinary skill in the art at the time of invention was made to have an additional sensor and thus would result in predictable results and would not require undue experimentation. Since it has been held that mere duplication of the essential working part of a device i.e., extra sensor on leg, involves only routine skill in the art. *St. Regis Paper Co. Vs Bemis Co.*, 193 USPQ 8; 549 F.2d 833 7th cir. 1977.

Response to Arguments

12. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BHAVESH V. AMIN whose telephone number is (571)270-3255. The examiner can normally be reached on M - T, Friday off, 7:30am to 6:00pm, EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BHAVESH V AMIN/

Examiner, Art Unit 3664

/KHOI TRAN/

Supervisory Patent Examiner, Art Unit 3664